Introduction to A.I., Robotics, and Coding (for Parents)

A guide for Analog Parents with Digital Kids

By Jair Ribeiro

Preface I

I am a mother. Apart from a few beautiful moments a day, when everything makes more sense, I feel it is impossible to escape the avalanche of daily duties. Then I am like a hamster in a spinning wheel.

What is happening when I am writing this? I just spend few nights looking for a place to stay for the holidays so that everyone would be satisfied, no one would sleep on the floor, and it did not cost several years of savings. Thankfully, I have all the apps that can help me to calculate, compare, and simply to find the best options according to my family preferences.

When I think of holidays, I have in my mind a need for new kid's clothes. I was barely satisfied with my choice of winter outfits - thick socks, slippers, caps, warm jackets… it already springs in the shops.

There is still snow outside, and my mind is not ready for the new season. However, if I will not buy something for the spring now, there will include a bikini collection right the corner.

I can barely handle my shopping, and we are running low on toilet paper or washing powder. Every day something is missing. No matter how much you will cook, everyone will always eat everything, which is still not enough.

While shopping, you need to continually buy something sweet for little ones, right? I barely embraced Halloween treats, and then there is already Santa in T.V. commercials. Grandma's day is straight the corner, then someone's birthday, followed by children's day, Father's Day, veteran's day, fisher day… you name it.

It is on me and the calendar on my cellphone to forget about some anniversaries or celebrations and anything related to it – proper clothes, gifts, something to bring to school, and classmates.

You filled fulfilled and proud because you just though your child to use a fork and knife, lace-up shoes, hang laundry and sit on the toilet seat. However, the learning of changing a roll of toilet paper or carrying a plate to the dishwasher is like Yoda level. Wait for it - about education; you will find out more lately.

I have barely finished the flat renovation to turn one room into my home office kingdom; then I see a crack in the bathroom tiles. Something always needs to be repaired somewhere, tightened or replaced.

Ok. Let us ignore it. I will do something for myself. Between going to the gym and reading a book, I decided to work on my silhouette. Then, where is the time for intellectual development? No, let us work on my dieter's waist, but I will need thinner clothes afterward. No, I should not spend on that. We need to save for kid teeth braces and new car tires. That is more important, so better I do not exercise at all.

YES. It is overwhelming, and I just mentioned few daily activities. It is not to sound frustrated, but we do not even realize how much is on our shoulders as parents. Jair Ribeiro, as a father of three, knows it as well. Correctly, he collected all the ideas of preparing kids in this more digitalized world we have these days.

Most importantly, how the adults can catch up, knowing that mentally they are in an analog version of themselves. Jair did that research for you.

Let us focus on the core here, so education and development. Usage of technology at every level is inevitable. Even our fridges are becoming more innovative, and their goal (to prevent the food from rotting) becomes secondary. They are instead the center of home entertainment with their screens, recipes, and online T.V.

It is on the parents to teach that strawberries do not come from those fridges at the best grocery store. Still, they grow on the farm, sometimes not even in their home country. In short, fridges, the same as any gadgets, will only increase their role in our households, if we let them.

We can always argue that it is up to schools to be the primary source of children's education. However, are current learning institutions ready to teach our children skills when they will be 20 or 30 years old?

Most of the teachers do not imagine this reality. It is easier to teach "the standards" than see the trends, speak about technology and use it in another way than smart chalkboards.

Jair made an in-depth analysis of our current A.I. knowledge and its potential, especially in the education sector. We know that creativity and the ability to solve unusual problems will undoubtedly be essential when our children become adults because the standard ones will be taken care of by robots, Artificial Intelligence, or something we do not imagine yet.

Children need to be educated in critical thinking, useful for example, in the war with fake news, going viral, and skillful learning, not only by memorizing knowledge.

The final part of it is ethic, which the author emphasis on many levels. Introducing tech to children without the ethical aspect of it is pointless. Giving a tablet or a smartphone is laidback. Still, the

consequences of not doing it appropriately might be echoing for years. As a mother, I am daily like a hamster in the spinning wheel.

When I sit in peace for a few moments, I already see a stain on the coffee table and little hands that marked the saliva window. Do I even have enough qualifications to be a parent? I doubt myself every day. Do I have time to even add ethics in between teaching children how to brush teeth or reviewing their biology exam?

Technology can help both parents and children. It's not a choice anymore to use it. It's a must. It's a new ability to navigate this world, the same as writing that you know M.S. Office in your CV. Jair is one of us, maybe just a bit more cautious and aware than average parents. Still, he understands all doubts each of us is having worldwide.

No matter where we are from and which background we have, our parental doubts are the same. The book navigates you and shows different angles to ideas that sound futuristic for us, but children become a standard.

It encourages you to foster conversations with children and with YOURSELF – conversations you did not imagine why you did not speak about before.

Agnieszka Koizumi (Małajny), CEE Communication & Employee Engagement Leader at IBM, Wroclaw, Poland

Preface II

Artificial Intelligence is now part of our daily life. For children even more, since these tools that do something for us were born with them or even before.

The children did not have to get used to the idea that these devices could respond automatically to their requests. They saw it and got used to what has become their reality.

How all this affects their behavior, their growth, and learning dynamics is now being studied by experts. Besides, even parents' direct observation can reveal how Alexa or other such tools affect the little ones' lives.

Artificial Intelligence is a concept that humans have been working on for over 60 years. Precisely since 1956, when the American mathematician John McCarthy coined the term Artificial Intelligence to show the ability of machines to do things or perform tasks that, if done by human beings, would require Intelligence.

In practice, simplifying as much as possible, we can say that the A.I. is a machine capable of copying and simulating every aspect of human learning and Intelligence. It is a set of electronic circuits and software instructions capable of giving a human observer the impression of dealing with another man and not with a machine.

Today, children are growing up in a world surrounded by artificial Intelligence: algorithms figure out what information they see, help select the videos they watch and shape how they learn to speak.

The hope is that by better understanding how algorithms are created and how they affect society, children could become more critical consumers of this technology. It may even motivate them to help shape its future.[1]

There are several reasons for teaching children about A.I. First, there is the economic argument: studies have shown that children's exposure to technical concepts stimulates their problem solving and critical thinking skills. It can trigger processes that lead them to learn computational skills more quickly.

Learning to deal with technology's ethics and social impacts in the early stages of higher learning can also help children become more aware creators, developers, and more informed citizens.

However, one of the risks that can be run is transferring the taxing attitudes that we tend to have with a device with Artificial Intelligence - which is at our service - to relationships with people in the flesh. In other words, a child may address a teacher or a

[1] How artificial intelligence is changing science | Stanford https://news.stanford.edu/2018/05/15/how-ai-is-changing-science/

classmate with the same somewhat aggressive tone with which he usually talks to the virtual assistant. Also, it could lead to not accepting no as an answer to some claims.

From a psychological point of view, one might be led to think that one can have a partner without having to have friendship, attention, affection. In short, without the "obligations" of a reciprocal relationship, while children still need human interaction to develop empathy, emotions, and language skills.

In this book, Jair addresses these and other issues clearly and in plain language, highlighting, for example, that current studies show that these fears are false problems. The little ones are perfectly able to distinguish the real from the virtual. As long as this separation stays clear, there is no reason to worry. Technology can also positively affect children's cognitive development.

Robots, for example, can be invaluable in resolving interpersonal conflicts. Above all, they can help and speed up learning specific skills, such as languages or proper nutrition rules.

Jair focuses on the importance of A.I. even for parents; at the same time, scholars continue to question the strengths and weaknesses of artificial Intelligence; parents have no choice but to look for expedients for these devices' correct use. First, these tools should not be allowed to babysit.

Furthermore, it is always necessary to ensure control over the little ones when dealing with robots, avoid wrong behaviors, and ensure human interaction.

Finally, it is essential to continue asking questions and adjusting one's attitudes thanks to the comparison and information obtained. Artificial Intelligence should not become another useless and passively accepted accessory in our lives. After so many years of studies and research, promises, and disappointments, artificial Intelligence has come into our daily lives and intends to stay there.

This book aims to move into artificial Intelligence because the author intends to increase the number of people able to understand and apply these advanced technologies.

The book aims to help understand the ongoing revolution and its challenges, to be more prepared for the significant changes expected in our life (public and private). In a popular way but with specific scientific references, the state of this technology's art and majors impacts are outlined. Expected benefits and risks to be faced are illustrated.

The focus is always on the importance of teaching Artificial Intelligence from an early age and in schools, as is already the case in many countries.

Each technology has always brought with it the fear of its use. However, in the end, the world gets better. Suppose we had to take stock of whether the Internet, for example, was a positive thing or not. In that case, there is no doubt that it has allowed society to leap forward. However, it is not enough that a few people understand the latest technology. Many must realize it.

David Bombelli, CityLife SpA, Milan, Italy

Preface III

It is notorious how, since the beginning of Humanity, knowledge has been passed down from generation to generation, as shown in the inscriptions in caves, papyri found in clay vases, historical documents that show how crafts and technologies (in the broadest sense of the word) crossed centuries and centuries.

We cannot look at the 4 Waves of Industrial Revolutions (Mechanization, Electricity, Computing, and Collaboration) without looking at the simple process of knowledge transfer adopted by sheepherders who, in remote times, made this activity their source of survival and movement of local and regional trade (we owe these nomads, for example, the numerical notations so used in our times).

Starting from raw materials available in nature, using the natural talent of some, and preserving techniques (in some cases millennial), we look at a legacy of objects made by potters, goldsmiths, carpenters, blacksmiths, metallurgists, artisans (a list that could span pages and pages).

Given this scenario, we cannot help wondering: How until today we have managed to keep Humanity in constant evolution and every day innovating more and more in various areas of knowledge and sciences (human and social, mathematical and logical-mathematical, as well as social applied)?

This question is becoming more and more relevant in a moment of constant demonstrations of negativism on a worldwide scale, even in the face of a pandemic challenge (already considered one of the greatest of our day) where science was once again challenged to seek solutions for problems through research and knowledge.2

Searching for a starting point to answer this question, I recall some reports by scholars and works that deal with the countless periods of diaspora experienced by Jews when, whenever their persecutors threatened their parents, they had in mind to save two basic things: your children and your books.

I understand that this concern of the Hebrew people comes from their remote Torah records where God instructs them in passing on to their children the knowledge (theological and technical) as a way of preserving the faith and, also, of their countless offices and techniques of human survival and maintenance.

Given this context of looking to preserve knowledge, Jair Ribeiro gives us the privilege of having at our disposal the work "A.I., Robotics, and Coding: A guide for Analogical Parents and their Digital Children," which brings in its content a proposal that should enchant the eyes of parents, children and also the entire academic and pedagogical community.

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[2] If Trudeau Can't Define the Middle Class, How Can He Work .... https://www.huffingtonpost.ca/maxime-bernier/justin-trudeau-middle-class_b_5120305.html

Jair and I are already in a Transitional World between Analog and Digital. We grew up surrounded by vinyl records, K7 tapes, radio amateurs, and T.V. of cathode ray tubes.

However, we were hit by a transformational wave where, with the boost of the Internet in the 90s in Brazil, we quickly started to dedicate ourselves to dynamic programming languages, network connectivity in an increasingly Open Source world with the popularization of platforms GNU and, also, for Innovations coming from the big companies in the Information Technology sector.

We cannot ignore that, even in the face of so much technological exposure, we had another factor that deserves to be highlighted to not do injustice to those around us.

We had Parents who, regardless of the Analog or Digital world, taught us to think creatively and technologically. This is the key to the question for the perpetuation of any area of knowledge.

We need to keep in mind the famous saying that "it is better to teach how to fish than to give the fish." As parents, we need to teach our children to think in an Innovative and Technological way if we want to keep alive this ancient chain of Knowledge Transfer that keeps our generations continually evolving.[3]

In this work, Jair presents us in an educational and very well-structured way the importance of learning about technology and how this discipline is fundamental for the future of the job market (in some cases, for jobs that do not yet exist). It calls our attention to parents and children's role in this process of exchanging experiences between generations who think differently.

[3] LISuperMom – Not All Superheroes Wear a Cape. https://lisupermom.wordpress.com/

Finally, it gives us a practical roadmap to seek help and tools to go on a family journey that takes us to a promising future.

Again, in Humanity, we are under denialism attacks. In some cases, we seem to be living in the dark times of the Middle Ages. However, it is up to us to keep the Light that drives us forward, and our children are key players on this battlefield.

Alem Moreira Martins Junior, IT Business Partner at VALE, Belo Horizonte, Brazil

Index

Contents

Preface I 2
Preface II 6
Preface III 10
Epigraph 14
Dedication 18
Introduction 19
Chapter 1 - The future and the digital technology 21
Why A.I., Robotics, and Coding? 27
Advantages of technology for children 28
Chapter 2 – Artificial Intelligence 33
Explaining A.I. to parents 34
A brief guide to the history of Artificial Intelligence 34
Artificial Intelligence today 40
Machine Learning and Deep Learning. 41
A.I. and its ethical boundaries. 43
Why do we need to start a discussion about ethics and technology? 44
How can you explain A.I. for your children (of all ages)? 46
A Basic Curriculum to your self-learning 48
Some resources to start with A.I. 49
The necessity of an ethical A.I. development. 51
Aligning A.I. with children's rights 52

Chapter 3 – Robotics 55
What is a robot? 58
What is robotics? 59
The impact of robots in our society. 60
Robotics and our children's development. 62
Advantages of Robotics for children 64
How can you help your children to learn robotics? 66
Where can you start with robotics? 67
Chapter 4 - Coding 71
Why should our children learn to code? 72
Teaching Programming languages to children can have several benefits. 73
Teaching coding without knowing how to code. 76
Programming languages you can teach to your children 77
Some free platforms that learn to program: 79
Scratch: 80
Blocky 80
Alice: 81
Codecademy: 82
Twine 82
Swift Playgrounds 82
Other Interactive ways to learn how to code. 83
Chapter 5 – Keeping technology under control 85
Introduction to Digital Emotional Intelligence 91
Are there any disadvantages of using technology? 93
Supporting your children when using technologies? 94

Acknowledgments 97
Afterword 98
About the Author 99
Social Media Links 99
Copyright and Disclaimer 100
Free Opinion Disclaimer 100
References 101
Image reference 103
Index 14
Books by this author 104
Learn AI online: More than 200 resources online to start learning AI today 104
The Terminator paradox: How neuroscience can help us to understand Empathy and the fear of Artificial Intelligence 104
AI 2020: A Year of Artificial Intelligence 105
Artificial Intelligence from A to Z: Demystifying the essential concepts of AI 106